

# Navigation, Guidance and Control

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## Foreword

These lecture notes cover material on navigation, guidance, and control as they apply to aerospace engineering. The first few chapters are dedicated to the basic concepts of navigation and guidance. The later chapters focus on the classical control system design, while touching upon some basic concepts in modern control systems.

**Acknowledgements.** The lecture notes on Navigation and Guidance have been used by me to teach a course in IISc since 1991 and have evolved over the years through several revisions, additions, and changes. The lecture notes on control are similarly developed for students at IISc since 2003. I would like to thank Professor Jason Speyer of UCLA who had given me the opportunity to teach parts of a similar course at UCLA. I am indebted to the students who attended my classes and gave me valuable inputs. The two reviewers (Dr. S.E. Talole of DIAT and Dr. A Sinha of IIT-B), who reviewed these specific NPTEL course notes, deserve a special note of thanks for their meticulous reviews and excellent suggestions.

**Suggestions for Students.** This web course is designed for self reading and learning although you may have an instructor who will teach you. The best way to learn any new subject is to read and understand it yourself. There are several assignments and questions given at the end of almost all the lectures. Since there are several standard books on these subjects available easily (a list is given at appropriate places), I would also urge you to solve problems from these books.

**Suggestions for Instructors.** An important aspect of teaching is a continuous but informal evaluation of how much the student has gained in terms of knowledge. Also, the best teacher is one who can get the students involved in the course. A good way to do this is to design some quiz questions, which should be kept simple, so that the students are not stressed while answering

them.

Finally, both students and instructors, please feel free to contact me over email if you have any questions and/or suggestions.

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